

**PAT-NO:** JP02003142364A  
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**TITLE:** METHOD FOR  
RECTANGULAR LATTICE  
DATA CONVERTING MASK  
PATTERN FOR CHARGED  
PARTICLE BEAM  
EXPOSURE AND METHOD  
FOR CHARGED PARTICLE  
BEAM EXPOSURE USING  
THE SAME  
**PUBN-DATE:** May 16, 2003

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**ABSTRACT:**

PROBLEM TO BE SOLVED: To assure the mask pattern dimensional accuracy, without generating under exposure region.

SOLUTION: When the width of a pattern element of a lattice pattern is  $W$ , the space width in between the pattern elements is  $S$ , a lattice pattern area density is  $\alpha_p$ , the minimum value of a forward scattering strength is  $F_{fmin}$ .  $\alpha_p$ , the position taking the minimum value is  $P$ , and the allowed lower limit value of the  $W$  and  $S$  is  $L_{min}$ , the  $\alpha_p$  is represented by a function  $D(W, S)$  from the geometrical relation of the lattice pattern, the forward scattering term of the energy

strength distribution function is surface-integrated, and the forward scattering strength at the position  $P$  is represented by the function  $E(P:W, S)$ . The method for rectangular lattice data converting the mask pattern for charged particle beam exposure comprises the steps of obtaining the values of the  $W$  and the  $S$  for satisfying the relational formula  $D(W, S) = \alpha_p$  and  $E(P:W, S) = F_{\min} \cdot \alpha_p$  (S71, S72) for the given values of the  $\alpha_p$ ,  $F_{\min}$  and  $L_{\min}$  (S70), converting the rectangular pattern to the lattice pattern (S74, S76) so as to satisfy  $W > L_{\min}$  and  $S > L_{\min}$  (S73, S75), and performing boundary-processing (S78).

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